

Mathematics

Outcomes	Algebra	Data and Probability	Number Numeracy skills, Fractions, Decimals and Percentages	Shapes Area, Perimeter, Volume, Angles
Basic	<ul style="list-style-type: none"> Know basic algebraic notation Know the equivalence between miles and kilometres 	<ul style="list-style-type: none"> Understand the terms mean, median, mode and range 	<ul style="list-style-type: none"> Understand and use place value Know the symbols =, ≠, <, >, ≤, ≥ Know the square numbers Know percentage and decimal equivalents for fractions with a denominator of 2, 3, 4, 5, 8 and 10 	<ul style="list-style-type: none"> Know that the diameter of a circle is twice the radius Know the conventions for a 2D coordinate grid Know that area of a rectangle = $l \times w$ Know the meaning of faces, edges and vertices Know the names of special triangles and quadrilaterals
Adequate	<ul style="list-style-type: none"> Use and apply simple formulae Uses technical language such as algebraic expressions, equations and formulae Use and interpret algebraic notation, including: ab in place of $a \times b$, $3y$ in place of $y + y + y$ and $3 \times y$, a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$, a/b in place of $a \div b$, brackets Substitute numerical values into formulae and algebraic expressions Generate terms of a sequence from a term-to-term rule 	<ul style="list-style-type: none"> Calculate and interpret the mean Interpret and construct pie charts and line graphs and use these to solve problems 	<ul style="list-style-type: none"> Know the first 6 cube numbers Know the first 12 triangular numbers Solve problems with negative numbers Use technical language such as prime numbers, factors, multiples, common factors, common multiples, highest common factor and lowest common multiple Use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 Apply the four operations, including formal written methods, to integers and decimals Use BODMAS i.e. Order of Operation Express one quantity as a fraction of another Define percentage as 'number of parts per hundred' Express one quantity as a percentage of another Simplifying a ratio Interpret percentages and percentage changes as a fraction or a decimal Compare two quantities using percentages 	<ul style="list-style-type: none"> Know that area of a triangle = $b \times h \div 2$ Know that volume of a cuboid = $l \times w \times h$ Describe positions on the full coordinate grid (all four quadrants) Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons Draw diagrams from written description Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres Use standard units of measure (length, area, volume/capacity, mass, time, money, etc.) Measure line segments and angles in geometric figures Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles Calculate perimeters of 2D shapes
Secure	<ul style="list-style-type: none"> Simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket Use function machines with inputs and outputs Express missing number problems algebraically 	<ul style="list-style-type: none"> Interpret, analyse and compare the distributions of data sets through averages (median, mean and mode) and spread (range) 	<ul style="list-style-type: none"> Check calculations using approximation and estimation Compare and order fractions, including fractions > 1 Order positive and negative integers, decimals and fractions Solve problems involving percentage change, including percentage increase/decrease Round numbers and measures to an appropriate degree of accuracy (nearest, d.p) Divide a quantity into given ratio 	<ul style="list-style-type: none"> Know that area of a parallelogram = $b \times h$ Know that area of a trapezium = $((a + b) \div 2) \times h$ Use, read, write and convert between standard units, converting measurements of length, mass, volume and time Derive and apply the properties and definitions of special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles Recognise that shapes with the same areas can have different perimeters Know and apply formulae to calculate volume of cuboids
Advanced	<ul style="list-style-type: none"> Cancel and simplify calculations and expressions Solve linear equations with one unknown algebraically 		<ul style="list-style-type: none"> Round numbers and measures to an appropriate degree of accuracy (nearest significant figure) Recognise and use sequences of triangular, square and cube numbers Use the symbols =, ≠, <, >, ≤, ≥ Apply the four operations, including formal written methods, to simple fractions (proper and improper), and mixed numbers 	<ul style="list-style-type: none"> Solve problems involving the calculation and conversion of units of measure Calculate surface area of cuboids Understand and use lines parallel to the axes, $y = x$ and $y = -x$ Solve geometrical problems on coordinate axes Identify, describe and construct congruent shapes including on coordinate axes, by considering rotation, reflection and translation
Excelling	<ul style="list-style-type: none"> Identify pairs of numbers that satisfy an equation with two unknowns 		<ul style="list-style-type: none"> Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples 	<ul style="list-style-type: none"> Describe translations as 2D vectors Calculate, estimate and compare and convert volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]